

RESTORATION TIME IN MESH NETWORKS**ABSTRACT OF THE DISCLOSURE**

A restoration path planner that minimizes the worst-case number of cross-connections that must be performed in a network in the event of a single element failure involves a two-phase optimization. The first phase involves finding two node-disjoint paths
5 for each service demand within a network such that the maximum link bandwidth in the network is minimized and the link bandwidths within the network are leveled. The second phase involves identifying the primary and restoration paths for each service demand within the network such that the worst-case number of cross-connections at any node within the network is minimized across all possible single-event failures. Embodiments also consider
10 service demand-bundling that groups service demands with the same source-destination node pairs and routes them along identical primary and restoration paths, and banding, which consolidates multiple low-rate demands into a high-rate demand and consequently decreases cross-connections required in the event of a failure.